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The Overlooked Half of a Large Whole: The Role of Environmental Quality Management in Supporting the Educational Environment

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ABSTRACT

The management of environmental quality of school buildings has, for too long, been the overlooked half of the larger whole of the strategic educational planning process. This paper examines the changing role of environmental quality management from its traditional operationally-based role, to an expanded, more dynamic role in strategic educational planning activities at the local, site-based level. First, a brief review of the state of knowledge concerning the impact of environmental quality on the educational process is presented. Second, the trend toward site-based management (SBM) in schools is discussed in light of the potential opportunities for developing a whole-system process of strategic educational planning that encompasses and integrates environmental quality management. Third, an action research study is presented in order to first illustrate the complex relationship that exists between day-to-day environmental quality management and educational instructional activities in many urban schools, and second, suggest a potential mechanism for drawing school and community representatives into the strategic planning and evaluation process at local school sites. The paper concludes that educators can be trained to collaborate in an environmental diagnostic process in which environmental quality concerns can be identified, prioritized and addressed in such a way as to be congruent with educational activities and goals, and that this process can be integrated within existing facility management decision making frameworks such as SBM school improvement teams.

INTRODUCTION

The impact of deteriorating environmental quality of schools on the health and safety problems of students, teachers, and communities is becoming more recognized by school officials worldwide [1]. A recent report published jointly by

the U.S. General Accounting Office (GAO) and the Department of Health and Human Services reports that 19 percent of schools in the U.S. are experiencing indoor air quality problems, 27 percent are reporting poor ventilation, and 19.2 percent report unsatisfactory heating. Other problems cited in the report include lack of building security, poor lighting and insufficient noise control [2].

What many school officials are not as cognizant of is that the lack of adequate management of environmental quality concerns can have an even greater impact on the efforts of educators in creating and managing motivational learning environments. A study conducted by the Education Writer's Association revealed that over 25 percent of all school buildings in the U.S. are considered inadequate for educational use by state facility directors, their inadequacy being a direct result of serious maintenance and repair needs, existence of environmental hazards, and overcrowding [3]. A correlational study conducted in the Washington D.C. school system revealed that educational building conditions may be affecting student performance and estimated that improved facilities could lead anywhere from a 5.5% to 11% improvement on standardized tests [4].

As these reports illustrate, the role of facility management in educational administration has received revived international attention. The Organization for Economic Co-operation and Development (OECD) indicates that the widespread movement towards decentralization of educational administration to local school sites (site-based management) with respect to the way resources are provided, managed and used is often neglected as a potentially effective means of providing greater job satisfaction and contributing to an overall improvement in the quality of schooling [5]. Based on the above findings, National Association of School Board Executives (NASBE) has recently advocated that school infrastructure agenda should be coupled with state and local educational programs in a more comprehensive strategic planning process in education [6]. This paper explores one aspect of the linkage between school infrastructure and educational programs: the role of environmental quality management in supporting the day-to-day educational activities within the local school site.

METHODOLOGY

This paper reports on a subset of the findings from a collaborative action research process of environmental quality assessment that includes not only facility managers and educational administrators, but teachers and students [7]. The study reports the findings from case studies which investigated the perceptions of environmental quality in five elementary schools within the Baltimore City Public Schools. Three questions directed the research for this study: (a) how is environmental quality perceived by occupants; (b) what are the attributes of environmental quality that occupants perceive, if at all, as having an impact on educational outcomes in their school; (c) what aspects of facility

management do occupants perceive, if any, possibly having an influence on environmental quality in their particular school?

Each individual case study investigation followed an action research process in which a selected number of teachers and administrators formed a working group that collaborated in interpreting surveys and interviews through a series of workshops. In the process, working groups identified, prioritized and addressed environmental concerns within their schools. Once the case reports were completed and presented to each school, they became data sets for further investigation. An across-case content analysis was conducted to compare and analyze differences in perceptions of environmental quality and facility management processes and practices.

'Quality' in the educational environment (i.e., environmental quality) has been defined by the OECD as comprising three broad groups of factors or attributes: (a) health and safety factors (comfort, materials safety, building security, cleanliness); (b) environmental factors (heating, lighting, ventilation); and (c) curriculum-related factors (program and support spaces, classroom adaptability) [8]. This definition only provided a starting point for understanding how environmental quality was *perceived by occupants in context*. As the study progressed, environmental quality attributes were identified and categorized through a qualitative content analysis of observations, surveys, interviews and workshops.

FINDINGS

Five environmental quality attributes were found to be perceived as being of most concern and are listed here in the order of their perceived priority: physical comfort and health, classroom adaptability, safety and security, building functionality, and aesthetics and appearance. This paper will report on the findings related to the two most critical environmental quality attributes of concern, physical comfort and health and classroom adaptability, which serve to illustrate the range of issues associated with environmental quality management in the elementary schools in the study.

Physical Comfort and Health

Physical comfort and health refers to the degree to which occupants feel the indoor environment meets their physiological needs with respect to thermal and air quality, illumination, noise and odors. Physical comfort and health was the most often discussed environmental quality of concern in the study, and the set of factors most often associated in the literature with quality in the educational environment. According to most teachers, physical comfort and health concerns are experienced most often on a daily (32%), weekly (37%), or monthly (22%)

basis. Issues identified by participant working groups included the following (listed from most to least mentioned):

- poor air flow and ventilation are seen as potentially contributing to many health-related problems
- problems of noise and distraction in open instructional areas are of concern
- cold zones in air-conditioned buildings are of constant concern
- poor bathroom ventilation, due primarily from ineffectively operating ceiling fans, causes some minor odor concerns
- old carpeting, especially at lower grade levels where students sit on the floor, is seen as a health concern
- excessive heat in the months from May to September is a concern
- acoustic problems in bathrooms and corridors may be due to the abundance of hard surface materials and the absence of sound absorbing materials

Although most teachers surveyed feel they have little or no control over the physical comfort and health concerns at their school (65%), and despite the feeling that physical comfort and health concerns have been somewhat hindering (44%) in providing an effective environment for teaching and learning, teachers feel that the manner in which physical comfort and health concerns have been dealt with at their schools has been only somewhat fair (45%). Overall, only 26% of teachers indicated they were somewhat to very disappointed with respect to how physical comfort and health concerns have been addressed. A majority of teachers feel that physical comfort and health is very important (65%) in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and very important (56%) in supporting the goal of increasing student academic performance.

Physical comfort and health and in particular, concerns over thermal comfort, air flow, ventilation, and noise were perceived by teachers to have an impact on student academic performance. Student academic performance refers here not only to achievement test scores, but also to evidence of day-to-day academic performance on in-class work assignments, quizzes and other tasks. Poor air flow circulation and ventilation were the main causes of concern for all schools in the study. Even when a few operable second floor windows are opened for example, very little fresh air can be effectively circulated. These conditions may be contributing to air borne bacteria causing many health-related problems which may in turn, have the potential of influencing student attitudes, mood and ultimately performance through lost instructional time. In addition, thermal comfort can be of critical concern during periods when tests are being conducted. Teachers believe, for instance, that their students are often unable to concentrate as easily on tasks.

Facility management staff, not surprisingly, are perceived by educators to have primary responsibility over physical comfort and health issues, notably thermal comfort, ventilation and air flow. Through the management of physical

comfort and health, custodians are recognized by educators as actively providing a supportive role in student performance. Teachers, on the other hand, see themselves and their students as more responsible for noise management in and outside their classrooms.

Classroom Adaptability

Classroom adaptability was the second most mentioned environmental quality concern of educators, and an environmental quality attribute that lacks the same clarity of management responsibility as that of physical comfort and health. Classroom adaptability refers to the degree to which occupants feel that the physical classroom space can be adapted to different and desired educational activities and functions. Fifty-percent of teachers responding to the survey indicated they are having problems with issues of classroom adaptability. Teachers experience problems most often on either a daily (14%), weekly (25%), or monthly (11%) basis, while 43% indicate they never experience any problems with classroom adaptability. Issues identified by participant working groups included the following (listed from most to least mentioned):

- concerns over the effectiveness and adaptability of open plan versus self-contained classrooms
- computer installation and other problems limit classroom adaptability
- the need for additional storage space options
- the need for additional electrical outlets in classrooms
- difficulty conducting inter-class projects
- problems with cooperative learning instruction in self-contained classrooms

An equal percentage of teachers (50%) feel they have little control over the classroom adaptability at their school as do those who feel they have significant control. However, only 38% of teachers feel that the manner in which classroom adaptability concerns have been dealt with at their schools has been fair or somewhat fair, as well as somewhat to very helpful (30%) in providing an effective environment for teaching and learning. Overall, 50% of teachers are somewhat to very pleased with how classroom adaptability concerns have been addressed at their school. A slight majority of teachers feel that classroom adaptability is either very important (52%), or somewhat important (34%) in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and either very important (55%), or somewhat important (31%) in supporting the goal of increasing student academic performance.

Classroom adaptability, specifically, concerns over both open plan and self-contained classrooms and technological adaptability, are perceived by educators to have an impact on student academic performance. Open plan instructional areas are seen by teachers as having an effect on student academic performance.

The open plan arrangement, the working groups argued, causes problems with noise and distractions from other classes that teachers believe breaks students' concentration. One working group felt that the availability of electrical outlets and the lack of wire cable runs for future computer installation may influence classroom adaptability thereby potentially effecting student academic performance. Teachers believe that the tightness of space and of working groups does not, at times, provide students with enough work surface to do their work, thereby creating distractions and effecting the quality of their work.

Even with the myriad of problems and concerns that custodians deal with on a daily basis, many environmental problems remain that educators do not hold the custodians responsible for. Classroom adaptability is one environmental quality that teachers do not expect custodians to be able to help them with; they themselves assume responsibility over the management of their instructional space. However, educators are not always aware of the problems they face or how to address them once they are called to their attention. This is the case with problems of classroom adaptability such as open classrooms and other arrangements that are mismatched with their particular educational programs and activities such as cooperative learning strategies and individualized learning centers. Addressing environmental quality management of curriculum-based factors is a much more complicated issue that has not been adequately addressed through current models of environmental quality management.

DISCUSSION

Despite calls for governance reform and discussions about 'building for learning' from national and international organizations, educators and educational administrators in the trenches continue to look past the potential leverage the design *and especially the management* of educational facilities can have in supporting their educational goals and objectives. Educational administrators are often more concerned with securing funds for school facilities than making sure the needs of educational programs are met in the building design [8]. Further, the articulation between educational goals, objective needs and facility design is often more of a concern for architects than it is for superintendents or principals, who seem to feel their options are highly constrained due to limited resources and state bureaucratic structures [9]. As a result, facility management decisions are not seen by educational administrators as a potentially useful strategic planning tool in improving educational quality and are de-coupled from educational decision making, when it pertains, for example to physical comfort and health or classroom adaptability concerns in this case study.

Any school administrator is likely to have a vision of the ideal place for learning. The vision and the reality, however, often do not coincide. The challenge is to make the reality of the school congruent with the ideal vision of the place for learning. It is the primary responsibility of the administrator to set standards for

care and upkeep of facilities and resources. School facilities must be cleaned, protected, preventively maintained, operated, repaired, and environmentally regulated. It is at this level that many administrators begin their efforts to improve the quality of the learning environment. However, there is growing sentiment from educators that indicates administrators are addressing few factors beyond the basic services mentioned. Educators insist that school facilities must be managed to support the educational program needs as well. Assessing the degree to which the school facility helps or hinders the educational activities contained within is the second, yet equally, as important step in attaining the vision of the school.

Similarly, even with good intentions, school facility management staff such as custodians, maintenance staff and engineers are for the most part minimally aware of the impact and potential their decisions may be having on educational instruction, activities and goals. To be fair, being responsible for tracing the impact of facility decisions on learning and instruction is not an explicit component of the facility manager's job description. Facility management activities in schools have traditionally focused on the performance of physical building systems, without a detailed consideration for how they might be managed to better serve learning activities. What is missing in facility management practices in school systems is a core competency in space planning and design which is responsive to specific educational processes.

CONCLUSION

The relationship between environmental quality management and strategic educational planning of the educational environment is arguably a blind spot of both educational administrators and facility management personnel. The findings from this study indicate the value of the collaborative action research process integrated with site-based management in identifying and prioritizing environmental quality concerns, as well as addressing potential solutions to these concerns. In short, the process demonstrates a potential holistic communication process between facility managers, educators, and educational administrators that links environmental quality concerns to specific goals, activities and outcomes of the educational process.

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